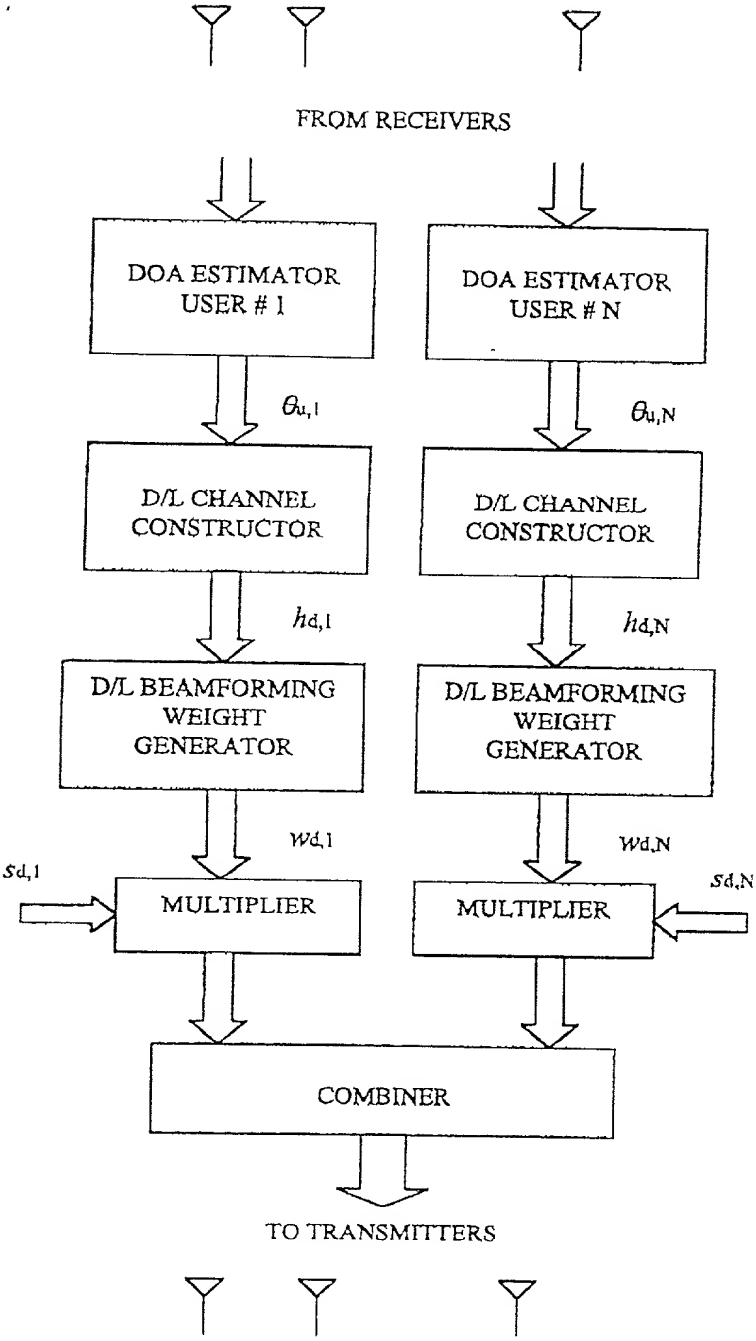

FIG.1 PRIOR ART

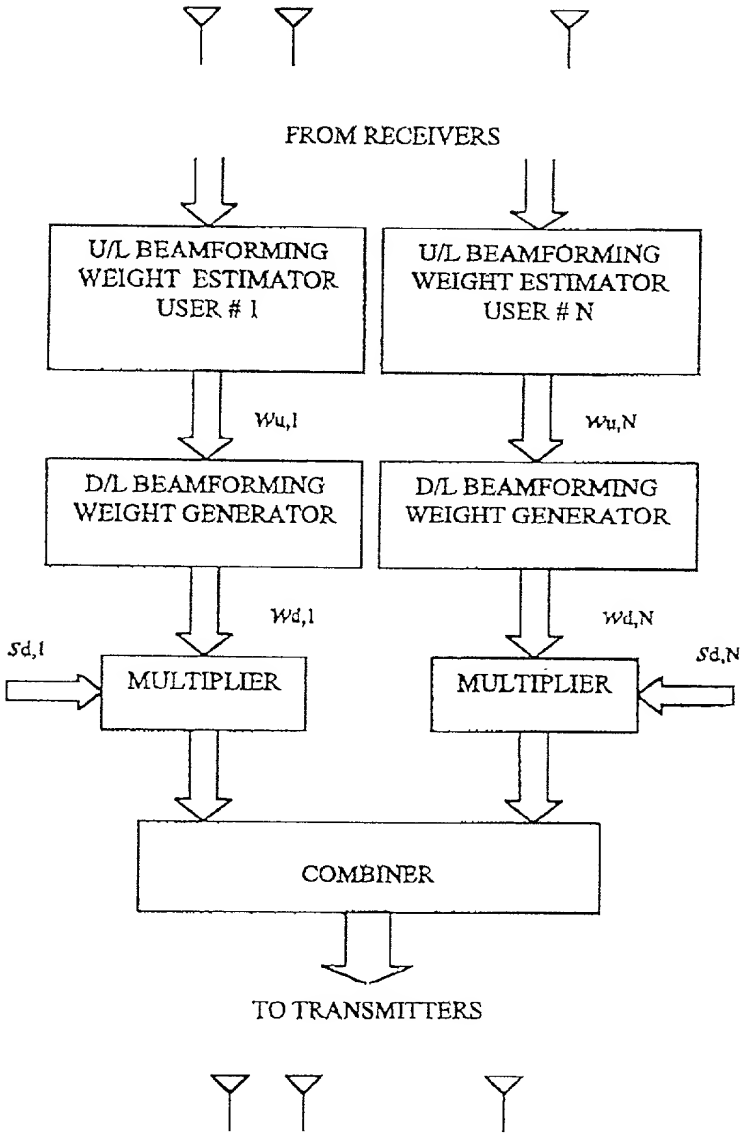
FROM RECEIVERS
U/L BEAMFORMING WEIGHT ESTIMATOR USER # 1
U/L BEAMFORMING WEIGHT ESTIMATOR USER # N
Wu,1
Wu,N
D/L BEAMFORMING WEIGHT GENERATOR
D/L BEAMFORMING WEIGHT GENERATOR
Wd,1
Wd,N
Sd,1
Sd,N
MULTIPLIER
MULTIPLIER
COMBINER
TO TRANSMITTERS

FIG. 2

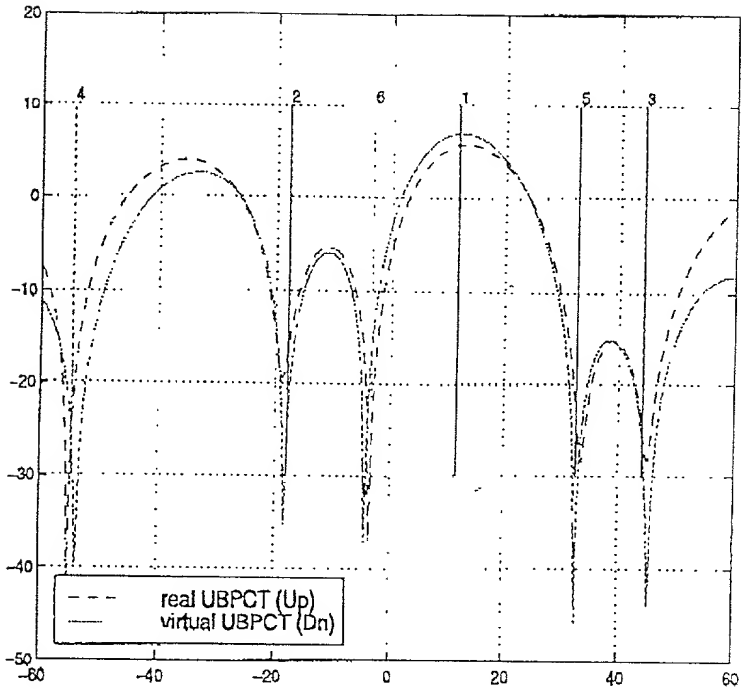
20
10
0
-10
-20
-30
-40
-50
-60
-40
-20
0
20
40
60
4
2
6
1
5
3
real UBPCT (Up)
virtual UBPCT (Dn)

FIG.3

09525452 - 050303

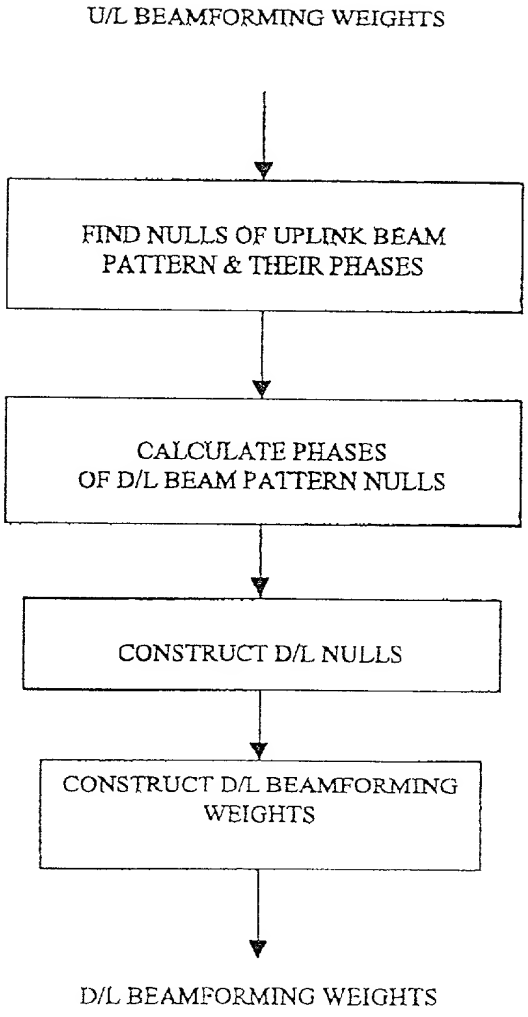

FIG.4

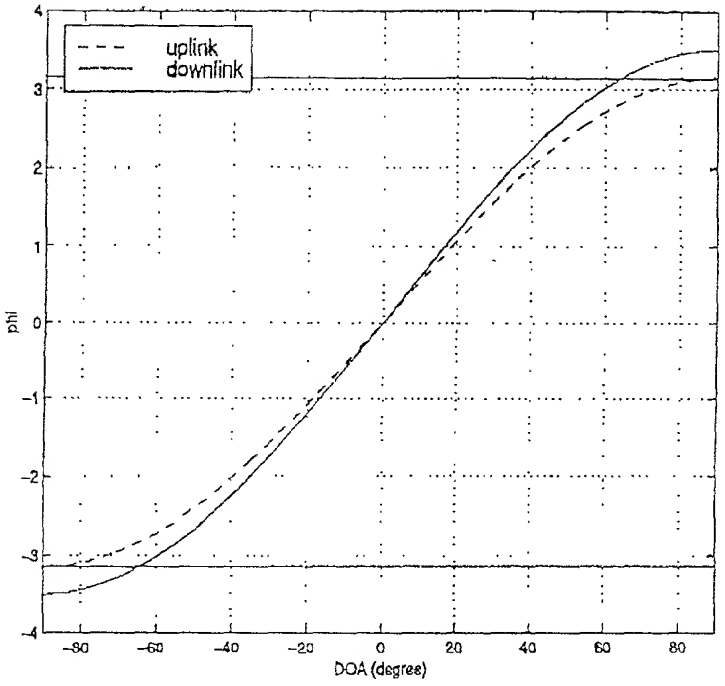
uplink
downlink
phi
DOA (degree)
4
3
2
1
0
-1
-2
-3
-4
-80
-60
-40
-20
0
20
40
60
80

FIG.5

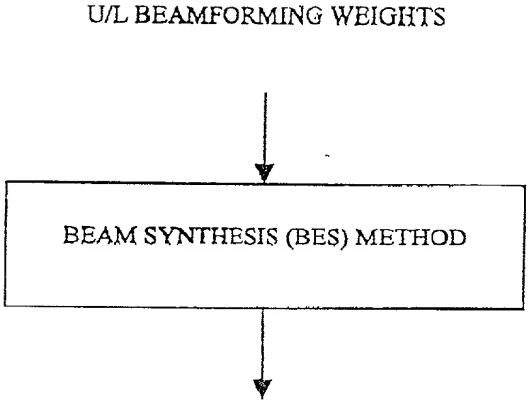
U/L BEAMFORMING WEIGHTS
BEAM SYNTHESIS (BES) METHOD
D/L BEAMFORMING WEIGHTS

FIG.6

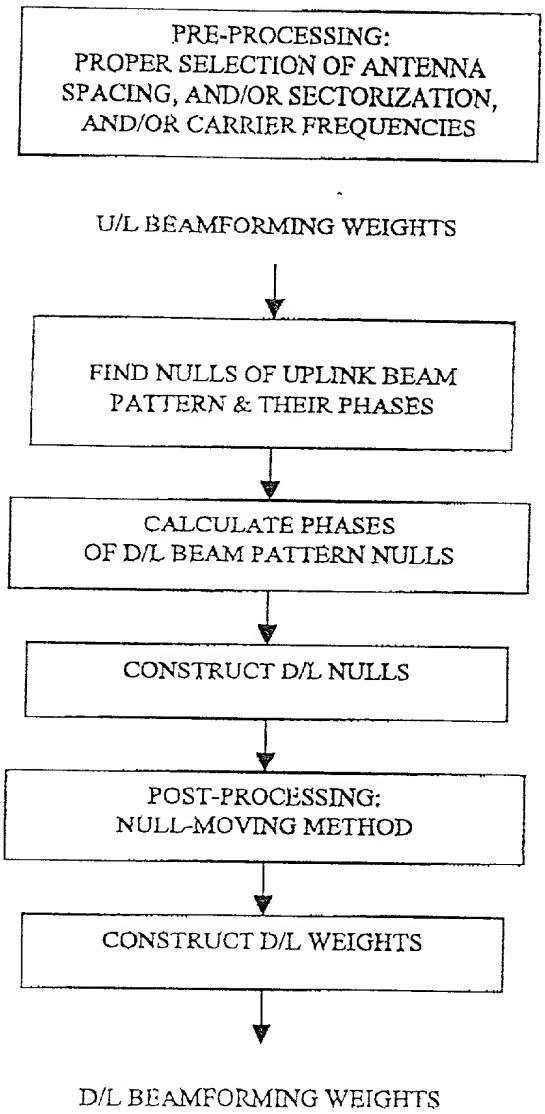
PRE-PROCESSING:
PROPER SELECTION OF ANTENNA SPACING, AND/OR SECTORIZATION, AND/OR CARRIER FREQUENCIES
U/L BEAMFORMING WEIGHTS
FIND NULLS OF UPLINK BEAM PATTERN & THEIR PHASES
CALCULATE PHASES OF D/L BEAM PATTERN NULLS
CONSTRUCT D/L NULLS
POST-PROCESSING:
NULL-MOVING METHOD
CONSTRUCT D/L WEIGHTS
D/L BEAMFORMING WEIGHTS

FIG.7

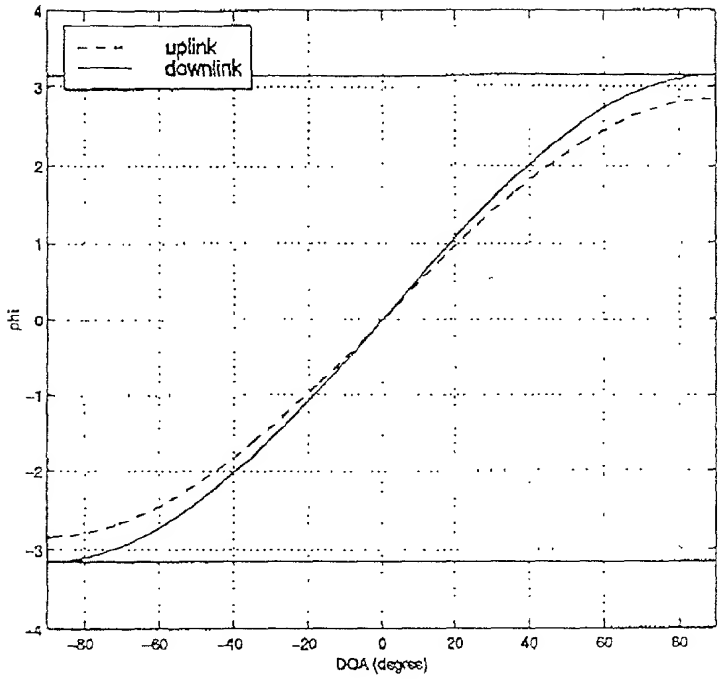
uplink
downlink
phi
DOA (degree)
4
3
2
1
0
-1
-2
-3
-4
-80
-60
-40
-20
0
20
40
60
80

FIG.8

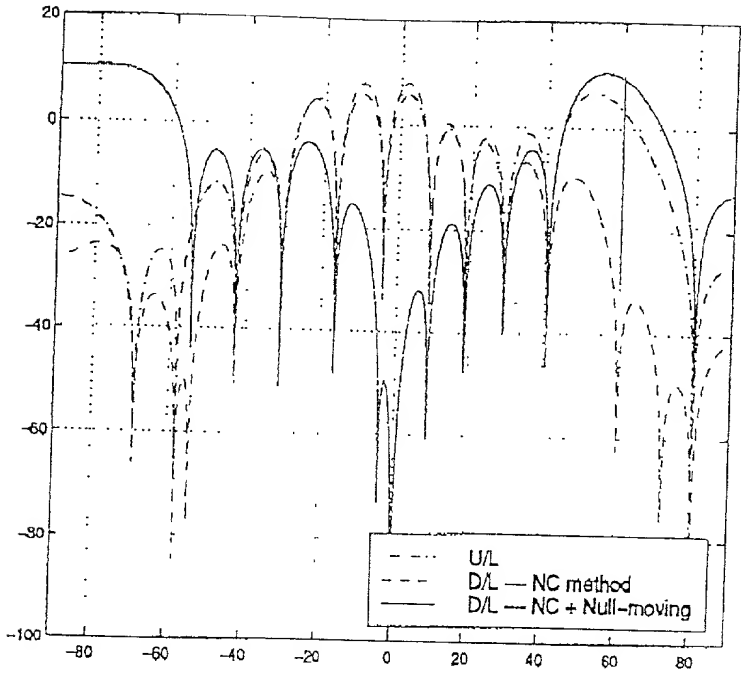
20
0
-20
-40
-60
-80
-100
-80
-60
-40
-20
0
20
40
60
80
U/L
D/L — NC method
D/L — NC + Null-moving

FIG.9